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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,627	01/13/2004	Rene Gerrit Heideman	145-001US	2466

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EXAMINER	
PAK, SUNG H	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/756,627	HEIDEMAN ET AL.	
	Examiner	Art Unit	
	Sung H. Pak	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/11/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicant's response filed 10/11/2005 has been entered. All pending claims have been carefully reconsidered in view of the response.

Information Disclosure Statement

Information disclosure statement filed 10/11/2005 has been considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6-9, 16-18, 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Temkin et al (US 6,580,864 B1).

Temkin reference discloses an optical device with all the limitations set for in the claims, including: a composite guiding region having at least three layers, lower and upper cladding layers have stress of the same sign (tensile- column 5 lines 43-52); said lower and upper cladding layers are separated by one or more core layer, which has stress of opposite sign (compressive

strain- column 5 lines 43-52); said core layer is suitable for guiding light based on refractive indices of the layers (column 5 lines 10-13);

wherein the lower and upper clad layers and core layer are conformal layers (Fig. 1);

wherein the magnitude of the stress is substantially equal (column 5 lines 52-56);

wherein the core layer is borosilicate glass (Figs. 1-2);

wherein the core layer is silicon dioxide (abstract).

Although Temkin does not explicitly state that the waveguide structure contains an electro-optic element, such element is inherently anticipated since it is to be used in WDM application as a planar lightwave circuit (column 1 lines 35-48).

Tempkin also discloses a method of forming such waveguide structure by depositing conformal layers.

Claims 10-13, 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Caneau et al (US 5,732,179).

Caneau discloses an optical device with all the limitations set forth in the claims, including: a surface waveguide comprising a lower and upper cladding having lower and upper cladding materials which have refractive index lower than refractive index of core material (column 6 lines 11-19); a core comprising an inner core and an outer core (2 layers), wherein the inner comprises inner core material, supports propagation of light, and has a first stress (tensile or compressive); outercore surrounding (in planar configuration) and comprising outer core material having a second stress (tensile or compressive) of opposite sign relative to the first stress (column 9 lines 33-60);

wherein one or more physical attributes of said inner core material and outer core material, which physical attributes are selected from the group consisting of inner core thickness, outer core layer thickness, inner core stress level, outer core stress level, and type of material, are combined to provide a modal birefringence of zero (column 9 lines 46-60);

wherein said lower and upper cladding materials and core materials are selected from group consisting of silicon (column 6 lines 20-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Temkin et al (US 6,580,864 B1).

Temkin reference discloses an optical device with limitations set forth in the claims as discussed above, except it does not explicitly teach the use of stoichiometric silicon nitride and silicon dioxide as cladding or core layers of the optical waveguide.

However, the use of stoichiometric silicon nitride and silicon dioxide materials as core and cladding layers is well known and common in the semiconductor optical waveguide art. Such materials are advantageously used because they provide low loss optical waveguides with enhanced light confinement for efficient optical transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Temkin to have stoichiometric silicon nitride and silicon dioxide layers.

Claims 14-15, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caneau et al (US 5,732,179).

Caneau reference discloses an optical device with limitations set forth in the claims as discussed above, except it does not explicitly teach the use of stoichiometric silicon nitride and silicon dioxide as cladding or core layers of the optical waveguide.

However, the use of stoichiometric silicon nitride and silicon dioxide materials as core and cladding layers is well known and common in the semiconductor optical waveguide art. Such materials are advantageously used because they provide low loss optical waveguides with enhanced light confinement for efficient optical transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Caneau to have stoichiometric silicon nitride and silicon dioxide layers.

Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caneau et al (US 5,732,179) in view of Parhami et al (US 6,704,487 B2).

Caneau reference discloses an optical device with limitations set forth in the claims as discussed above, except it does not explicitly teach the steps of removing portions of waveguide layer materials as claimed.

On the other hand, Parhami explicitly teaches the steps of removing portions of waveguide layer materials and forming trenches in fabricating waveguide structure with low birefringence (abstract). Such feature is considered advantageous and desirable because it provides additional relief from internal stress of the waveguiding layers and lowers undesired birefringence. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Caneau to have portions of waveguiding layers removed as taught by Parhami.

Conclusion

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 10/11/2005 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

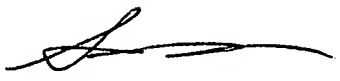
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571)272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak
Primary Patent Examiner
Art Unit 2874